

Notes on Some Virginia Millipeds of the Family Polydesmidae

RICHARD L. HOFFMAN
Clifton Forge, Virginia

The following observations on polydesmid millipeds pertain to members of four related genera which occur in Virginia, and have been made more or less incidentally to studies in other groups. Because of their brevity they may be profitably assembled and presented together.

GENUS SCYTONOTUS KOCH¹

Remarkably enough, the homogeneity of the widespread eastern milliped *Scytonotus granulatus* (Say) has never been questioned by American authors, despite its having been recorded from such distant localities as Iowa, New York, and North Carolina. Considering the small size and, presumably, low degree of vagility of the animal, one would expect considerable manifestation of localized speciation at peripheral portions of the range.

In 1943, H. F. Loomis described *Lasiolathus virginicus* as a new genus and species of milliped, said to be related to *Scytonotus*. Mature specimens were lacking, and generic characters were taken from non-sexual modifications, chiefly degree of dorsal tuberculation, serration of the keels, and setiferous condition of the tergites. Adults of *Lasiolathus* were never found, although the form has been reported from Virginia, Kentucky, and Tennessee. Later, in 1947, I found that *Lasiolathus* was but the immature stage of *Scytonotus*, based on observations made in Alleghany County, Virginia; and in that year published a short paper synonymizing Loomis' genus and species under *S. granulatus*. Since Loomis and I agreed that the Alleghany County immatures were his *L. virginicus*, I created the synonymy on the unfortunate assumption that *granulatus* was the only eastern member of the genus.

While recently examining diplopods taken on the Blue Ridge in Albemarle County, Va., I was surprised to note that the male gonopods of the locally abundant *Scytonotus* differed trenchantly from those of more western specimens. Knowing that the Blue Ridge is populated by a number of endemic species of animals, I suspected that the specimens might be the form described by Loomis. Accordingly a trip was made to the type locality of *L. virginicus*, and a mature male specimen, which

¹American authors have long referred *Scytonotus* to the family Sphaeriotrichopidae, although Attems, who established the family and described most of its genera, pointed out the error of doing so in 1931 (Zoologica, v. 30, Heft, 79, p. 144).

is herein designated as plesiotype, was obtained. It agrees in every respect with the Albemarle specimens, and it now becomes necessary to revive Loomis' name for this species of the Virginia Blue Ridge.

Perhaps the small size of the animal, and superficial similarity of the male gonopods have contributed to the universal acceptance of the name *granulatus*. I suspect that the latter factor has been largely responsible, for the few published drawings, even those of Cook & Cook (1895, Ann. N. Y. Acad. Sci., 9: fig. 7) appear to be somewhat oversimplified. I have cleared and mounted a number of gonopods, and microscopic study of these reveals that diagnostic characters are abundant and that no appreciable intraspecific variation occurs. For the accompanying drawings, outlines were made from low power magnification (100 x) and details added from higher power observation (430 x).

SCYTONOTUS VIRGINICUS Loomis

Figure 2.

Lasiolathus virginicus Loomis, 1943, Journ. Washington Acad. Sci., 33: 318-320.

Scytonotus granulatus Hoffman, 1947, Proc. Biol. Soc. Washington, 60: 139-140.

Type locality.—Panorama, Thornton Gap, Page-Rappahannock counties, Virginia.

Type specimens.—Immature male holotype in the Museum of Comparative Zoology and immature male paratype in the U. S. National Museum, collected by H. F. Loomis. Adult male plesiotype in my personal collection, collected by Anne K. Brown, Hubert I. Kleinpeter, and Richard L. Hoffman, March 29, 1949. •

Records.—I have material of *virginicus* from two places other than the type locality. These are both in the Blue Ridge in Virginia, as follows: Albemarle Co.: Sugar Hollow, 6 miles west of Whitehall, October 31, 1947, March 3, 1949, March 21, 1949. Nelson Co.: Humpback Mountain, 4 miles south of Afton, November 29, 1948. The range of the species as presently known is approximately the same as that of the recently described xystodesmid milliped *Nannaria morrisoni* Hoffman.

Remarks.—In addition to the obvious differences in the gonopods, *S. virginicus* is further distinct in that the penultimate joints of the male legs are not enlarged and produced as in *granulatus*. As far as overall size and color go, the two species are very similar.

GENUS BRACHYDESMUS HELLER

For several years I have occasionally found specimens of a small polydesmid, which I identified as a member of the genus *Brachydesmus*, in the garden of my residence at Clifton Forge, Alleghany County, Va. On recently having access to Dr. Carl Graf Attems' monumental treatises

on the polydesmoids of the world (Das Tierreich, Lief. 68-70) I identified the animal as a subspecies of *B. superus* described by Attems from Goteborg, Sweden. The citation is as follows.

BRACHYDESMUS SUPERUS SCANDANAVIUS Attems

Figure 3

Brachydesmus superus scandanavius Attems, 1927, Abh. Senckenb. Ges., 39: 263, figs. 26-28; 1940, Das Tierreich, 70: 121, fig. 170.

Attems' figure in the second work cited above is drawn from a gonopod in a somewhat oblique position, and apparently from a magnification too low to show all of the structure properly. The accompanying drawing is made from a gonopod of a Clifton Forge specimen, cleared in KOH and mounted in balsam. High power (430 x) magnification was found necessary.

I find that differences between *scandanavius* and *B. s. elbanus* Attems from the Mediterranean region are very slight, and suspect that the former is perhaps only an individual variation of the latter, transported to Sweden by commerce. For the present, however, it seems possible to separate *scandanavius* by the shorter subpulvillar spine (d) and the slightly more proximal position of the median endspine (i). Also, the denticulations of the gonopod femur (P) are much larger in *elbanus*.²

Brachydesmus, as Attems points out, is a Palearctic genus, and I suspect that all of the North American forms described under this name will prove to be but introduced European species, much as Prof. R. V. Chamberlin pointed out, nearly three decades ago (1921) for julid millipeds.

Illustrations of the species named by various American workers leave much to be desired. The best illustrated gonopod, that of *B. pallidus* Loomis (1939: 191) leaves no doubt that the species is a member of the *superus* complex, but even this seems to be drawn without adequate magnification. Another eastern form is *B. dux* Chamberlin (1940: 284) from North Carolina; the drawing of its gonopod engenders doubt that the animal is even a member of the Polydesmidae, for the hairpad said by Attems to be typical of the family is not shown, and the general appearance of the appendage is very unlike that characteristic of *Brachydesmus* and related forms. *B. gladiolus* Williams and Hefner (1928: 113) from Ohio is admittedly like *superus*. It seems to differ from the typical form, but may prove to be one of the subspecies or varieties.

²These terms are English equivalents of those used by Attems, and the abbreviations on the drawings of the *Brachydesmus* gonopod are the same as those employed in the Tierreich monograph.

B. s. scandinavicus has not been previously reported from this country. It is of some interest that a localized subspecies would be imported instead of one of the widespread forms. Presumably it came to western Virginia in bulbs or other produce before the inauguration of strict quarantine measures.

GENUS PSEUDOPOLYDESMUS ATTEMPS

A small member of this genus obtained near Norfolk, Va., during the course of herpetological field work, proves to be undescribed. Judged from the male gonopods, the relationships of this species appear to be with certain southern and midwestern forms, rather than with the widespread *P. serratus* (Say) which occurs in the same region. It may be a northern member of an "Austral" group of species of this genus.

PSEUDOPOLYDESMUS PALUDICOLUS, new species

Figure 4

Type specimen.—Adult male. U.S. Nat. Mus. no. 1871, collected at Sand Bridge, 5 miles south of Virginia Beach, Princess Anne Co., Va., May 8, 1949. L. M. Carter, H. I. Kleinpeter, and R. L. Hoffman, colls.

Diagnosis.—Male gonopods characteristic in the following particulars: femur with a large subpulvillar tooth (d) and a definite endomerite (e) immediately laterad of it, no basal femoral denticulations; tibiotarsus with a broad, two-pointed flangelike process (h) and a large single subterminal tooth (i), surrounded by a tuft of flat bristles.

Description of male type.—A small species, length 13, width, 2.3 mm.; general proportions and configuration of body similar to *P. serratus*. The following points are noteworthy: tergites with only two transverse rows of quadrate areas (the normal first row not differentiated); usually four areas in the anterior row and six in the posterior; edges of keels not denticulated, the caudolateral corners produced caudad rather more noticeably than in other species.

Sternites between the 5th, 6th, 9th, and 10th pair of legs with paired, distally setose processes.

Male gonopods as illustrated (fig. 4).

Color uniform light brown dorsally, somewhat paler on the ventral surface; distal article of antenna piceous.

Remarks.—This description is based on a single individual found under a board on the inner dunes several hundred feet inland from the ocean. The vegetation is chiefly grass and sedge, with a few pines and thickets of *Myrica*. No other diplopods were found, nor any chilopods.

GENUS DIXIDESMUS CHAMBERLIN

This genus of the southern Appalachians is represented in Virginia by a single, very characteristic, species which seems to reach its northernmost limits in this State.

DIXIDESMUS BRANNERI (Bollman)

Polydesmus branneri Bollman, 1887, Proc. U.S. Nat. Mus., 10:620.

At present, the known range of this species is approximately from Gainesville, Florida, and southern Mississippi, north through the Appalachians to central western Virginia. Available local records, arranged from south to north, are as follows:

Smyth-Grayson cos.—Mount Rogers, 5400 feet, July 1-2, 1947. *Tazewell Co.*—Beartown Mountain at Burkes Garden, 4600 feet, June 30, 1947. *Floyd Co.*—Rocky Knob Park, 6 miles S.W. of Floyd, July 3, 1947. *Giles Co.*—Mountain Lake, 3800 feet, June-July, 1947. *Bedford Co.*—Blue Ridge Parkway, south of Apple Orchard Mountain, 3800 feet, March 25, 1948. *Alleghany Co.*—3 miles N. W. of Clifton Forge, 1500 feet, March-October. *Bath Co.*—Warm Springs Mountain, east of Hot Springs, March, 1947; 7.4 miles S.W. of Milboro Springs, Rt. 42, 1300 feet, May 11, 1947. *Rockbridge Co.*—Goshen Pass, 1400 feet, June 16, 1947; west side of Rocky Mountain, Blue Ridge Parkway, August 24, 1949. *Nelson Co.*—Crabtree Falls, June 16, 1948. *Nelson-Augusta cos.*—Humpback Mountain, 6 miles south of Afton, 2500 feet, June 17, 1947.

Collections made farther north along the Blue Ridge in Albemarle County have failed to reveal *branneri*, as have investigations in the Alleghanies north of Hot Springs. Extensive collections from the vicinity of Thornton Gap (in the U.S. National Museum) contain only *Pseudopolydesmus serratus*.

Dixidesmus apparently enjoyed a much wider former range, as suggested by the presence of two species in the mountains of southern New York and adjacent northeast Pennsylvania. Collecting in central Pennsylvania and Maryland would be of interest, to determine whether the present discontinuity is real or only apparent.

As regards habitat, *D. branneri* shows a marked predilection for cool, moist situations such as afforded by high mountains and deep water-gaps. In the southern part of its range, however, a much greater ecological tolerance is shown by the occurrence of the species in the hot lowlands of Georgia and Florida.

Living specimens of *branneri* are immediately distinct in color. The tergites are black with the keels very strikingly brick-red or pink, as opposed to the uniform brown dorsum of *serratus* and other pseudopolydesmids.

REFERENCES

- Attems, Carl G. 1940. Myriapoda 3, Polydesmoidea III (Fam. Polydesmidae, Vanhoeffenidae, Cryptodesmidae, Oniscodesmidae, Sphaeriotrichopidae, Peridotodesmidae, Rhachidesmidae, Macellolophidae, Pandirodesmidae) in: *Das Tierreich, Lief. 70*, pp. i-xxxii, 1-577, fig. 1-719. *Walter de Gruyter & Co., Berlin*.
- Chamberlin, Ralph V. 1921. The Julidae and Isobatidae in North America. *Proc. Biol. Soc. Washington*, vol. 34, pp. 81-84.
- 1940. Four new polydesmoid millipeds from North Carolina. *Entomological News*, vol. 51, pp. 282-284.
- Hoffman, Richard L. 1947. The status of the milliped *Lasiolathus virginicus*, with notes on *Scytonotus granulatus*. *Proc. Biol. Soc. Washington*, vol. 60, pp. 139-140.
- Loomis, Harold F. 1939. The millipeds collected in Appalachian caves by Mr. Kenneth Dearolf. *Bull. Mus. Comp. Zool.*, vol. 86, no. 4, pp. 165-193.
- 1943. A new genus of Virginia millipeds related to *Scytonotus* and a new species from Florida. *Journ. Washington Acad. Sci.*, vol. 33, no. 10, pp. 318-320.
- Williams, Stephen R., and Robert A. Hefner. 1928. The millipeds and centipedes of Ohio. *Bull. Univ. Ohio*, vol. 33 (Bull. Ohio Biol. Survey, no. 18), pp. 1, fig. 1.

EXPLANATION OF PLATE

- Fig. 1. *Scytonotus granulatus* (Say). Mesial view of left gonopod of male from Clifton Forge, Va. Solenite not shown.
- Fig. 2. *Scytonotus virginicus* (Loomie). Mesial view of left gonopod of male, Sugar Hollow, Albemarle Co., Va.
- Fig. 3. *Brachydesmus superus scandinavicus* Attems. Mesial view of right gonopod of male, Clifton Forge, Va., Abbreviations: *d*, subpulvillar tooth; *i*, median end-spine; *P*, femur.
- Fig. 4. *Pseudopolydesmus paludicolus* Hoffman. Mesial view of left gonopod of male holotype, Sand Bridge, Va. Abbreviations: *d*, subpulvillar tooth; *e*, endomerite; *h*, tibiotarsal median flange; *i*, sub-terminal tooth.

